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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,168	08/08/2003	Marc Tremblay	SUN-P9327-MEG	2947

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EXAMINER

PATEL, KAUSHIKKUMAR M

ART UNIT

PAPER NUMBER

2188

DATE MAILED: 11/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/637,168	TREMBLAY ET AL.	
	Examiner	Art Unit	
	Kaushikkumar Patel	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Priority

- ### ***Claim Rejections - 35 USC § 103***

- encountering a load instruction during transactional execution of a block of instructions in a program (page 298, column 1, lines 1-2, taught as filter is used to determine candidate load/store pairs for speculative execution), wherein changes made during the transactional execution are not committed to the architectural state of a processor until the transactional execution successfully completes (taught as critical

section is executed speculatively and the results are buffered. If atomicity is not violated the results are committed. Transactions as taught by Jim Gray, either happens or it does not (page 144, column 2), thus Rajwar explicitly teaches transactional execution). Monitored load instruction is not well known to ordinary skilled in the art, hence the definition from the specification of the present application as understood by the examiner as the instruction need to be monitored for interference during the speculative execution of the critical section. Rajwar teaches load instruction and monitors the interferences by other processor (page 299, section 5.1 lines 1-2 for initiating load instruction, and section 5.3 for monitoring of interference) thus Rajwar inherently teaches generating monitored load instruction. Rajwar also teaches load marking of the cache lines (page 296, section 2.2, line 3). Rajwar fails to teach selectively monitoring the load instruction, but Rajwar states that limited resources may force a miss-speculation if either there is not enough buffer space to store due to finite cache size and the number of unique cache lines modified (marked for interference detection) exceeds the write-buffer size (page 300 column 1). Jim Gray teaches transactions can be categorized as unprotected, protected and real. Jim Gray also teaches transactions of unprotected data need not be undone or redone if the transaction must be aborted (page 145 column 1).

It would have been obvious to one having ordinary skilled in the art at the time of the invention to have modified the transactional execution system of the Rajwar using the teachings of Jim Gray by generating selectively monitored load instructions to reduce the marking of the cache lines and hence increase the write-buffer size

(limitations of Rajwar as explained above). As Jim Gray implicitly teaches that all transaction need not be monitored for the interference because unprotected transactions need not to be redone.

As per claims 2,5,15 and 18, it would have been obvious to one having ordinary skill in the art at the time of the invention would have generated monitored load instruction towards protected data to monitor interference from other processor as per claim 1 and 14. Also one having ordinary skill in the art would have generated unmonitored load instruction for unprotected data.

As per claims 3 and 16, protected data structure as well known to one having ordinary skill in the art means, the data that needs to be protected from other processors by means of locking or using semaphores. As such one having ordinary skill in the art would have monitored the load operations associated with protected data for interference.

Regarding claims 4 and 17: A heap is a portion of a memory reserved for a program to use for the temporary storage of data structures. So any processor can access data from heap and hence the load instruction associated with the heap must be monitored for interference.

Regarding claims 6 and 19: Op code (as defined in Microsoft Computer Dictionary on page 378) is a portion of part of machine language instruction that specifies the type of instruction and the structure of the data on which it operates. Accordingly, one having ordinary skilled in the art at the time of the invention would

As per claims 10 and 23, Rajwar teaches that if a data conflict occurs the atomicity cannot be guaranteed and such execution is not retired architecturally (i.e. changes are not committed) (page 297, column 1, lines 4-10) and if atomicity is maintained then processor can try to execute the algorithm again (page 297, column 1, lines 28-30).

As per claims 12 and 25, Rajwar teaches that the atomicity is maintain by read-modify-write primitives (page 296, column 1, section 2.2) and interfering data access under such primitives are store by another processor to the load-marked cache line or load or store by another processor to a cache line that has been store marked (page 296, section 3.2, lines 13-19).

Claim Rejections - 35 USC § 103

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Conclusion

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kaushikkumar Patel
Examiner
Art Unit 2188

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Kevin L. Ellis
Primary Examiner

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